DOCUMENT RESUME

ED 455 795 IR 020 751

AUTHOR	Solomon, David L.
TITLE	Toward a Post-Modern Agenda in Instructional Technology.
PUB DATE	2000-10-00
NOTE	15p.; In: Annual Proceedings of Selected Research and Development Papers Presented at the National Convention of the Association for Educational Communications and Technology (23rd, Denver, CO, October 25-28, 2000). Volumes 1-2; see IR 020 712.
PUB TYPE	Reports - Evaluative (142) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Computer Assisted Instruction; Computer Uses in Education; Education; Educational Development; Educational Research; *Educational Technology; Educational Theories; Instructional Development; *Postmodernism; Research and Development

ABSTRACT

Traditional views in instructional technology are often based upon the application of scientific knowledge. An alternative paradigm, post-modernism questions whether science alone offers the best approach to teaching and learning. Post-modernism offers alternative perspectives on the theory and practice of instructional technology; however, its potential contributions to the field require clarification. There are two major impediments to building a post-modern agenda in instructional technology. First, a widely accepted definition does not exist. Second, the implications for theory construction are unclear (perhaps as a consequence of poor definition). The purpose of this paper is to construct an integrative and cogent definition of post-modernism that will initiate dialogue among professionals in the field. Part One of this paper addresses several issues that are impacting the definition of post-modernism. Part Two presents general assumptions about post-modernism and constructs a definition of post-modernism that will promote communication within the field. Part Three explores the potential contributions of post-modern concepts in instructional technology. (Contains 80 references.) (AEF)

Reproductions supplied by EDRS are the best that can be made
from the original document.

M. Simonson

Toward a Post-Modern Agenda in Instructional Technology

David L. Solomon
Wayne State University

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED 455 795

Abstract

"Post-modernists look to the past and future equally and position themselves in the present, seeing time as a broken continuum in need of acknowledgement" (Jencks, 1992b, p. 6).

Traditional views in instructional technology are often based upon the application of scientific knowledge. Post-modernism, an alternative paradigm, questions whether science alone offers the best approach to teaching and learning. Post-modernism holds promise for guiding research and development in instructional technology; however, its potential contributions to the field require clarification. Accordingly, cogent definitions of post-modernism have been constructed -- from an instructional technologist's point of view – and implications for the field have been presented to address the concerns of critics. This paper received the 2000 ETR&D Young Scholar Award and the author notes that the term, "post-modern," shall be hyphenated to symbolize "... the continuation of Modernism and its transcendence" (Jencks, 1995, p.30).

Throughout its history, the field of instructional technology has been focused on improving teaching and learning through technology (Ely, 1999; Saettler, 1990). Over the years, various interpretations of the word, "technology," have been at the root of inquiry and debate in our field. As a result, traditional and alternative approaches to theory development and practice have emerged. A traditional interpretation of technology is the systematic application of science (Clark & Estes, 1998) which emphasizes the utilization of scientific knowledge and principles (Seels & Richey, 1994). Grounded in the behavioral sciences, traditional approaches to instructional technology share common values including the use of precision-based methods, measurement, replicability, predictability and order (Gustafson & Tillman, 1991; Jonassen et al., 1997; Seels & Richey, 1994). Alternative perspectives in our field assume a broader interpretation of technology as the systematic application of *all* sources of organized knowledge (e.g., literature, science, the arts), suggesting that art, craft and science all have roles to play in instructional technology (Davies, 1981/1991; Richey, 1995; Seels, 1995). Whereas traditional views in our field rely solely upon scientific knowledge, post-modernism, an alternative paradigm, questions whether or not science alone offers the best path (Wilson, 1997a). Within the past 10 years, post-modern perspectives in instructional technology have been receiving greater attention within the Association for Educational Communication and Technology (Wilson, 1997a). In addition, a growing number of publications in the field have begun to define a post-modern agenda. While the *Handbook of Research for Educational Communications and Technology* (Jonassen, 1996) included postmodern theory as a foundation for research in our field, the post-modern agenda remains unclear. Agenda-building is a process through which problems or issues receive professional attention (Richey, 1997). Within this agenda-building framework, ideas that influence professional communities are aligned with the broader agendas of the field (Richey, 1997). Therefore, communication is an important part of the support building process, particularly in theory development (Richey, 1997). Post-modernism offers alternative perspectives on the theory and practice of instructional technology; however, agenda status in our field will never be achieved until communication can be facilitated. There are two major impediments to building a post-modern agenda in instructional technology: First, a widely accepted definition of post-modernism does not exist. Second, the implications for theory construction are unclear (perhaps a consequence of poor definition). Therefore, the purpose of this paper is to construct an integrative and cogent definition of post-modernism that will initiate dialogue among professionals in our field. There are several inherent challenges to accomplishing this goal. Since post-modern discourse is mostly abstract and obscure, it becomes necessary to simplify subject matter and render it less complex for our professional community. This reductionistic process is fundamentally opposed to post-modern principles. In addition, this paper summarizes the literature that has been written about post-modernism across a variety of disciplines; and, while it is always important to see the tip of an iceberg while navigating through uncharted territories, we must also acknowledge the presence of something that has far greater depth.

Part One of this paper will address several issues impacting the definition of post-modernism. Part Two will construct a cogent definition of post-modernism that will promote communication within the field; and, Part Three will explore the potential contributions of post-modern concepts in instructional technology. Despite the challenges, this paper was written with the hopes of taking a step forward in the support-building process.

IR020751

BEST COPY AVAILABLE

Part One: Issues Impacting the Definition

One major source of confusion regarding post-modernism has been the elusive language of post-modern discourse. Walter Truett Anderson (1995b) offers the following insight into this dilemma:

> The postmodern era has given the world some really good ideas and some really bad writing. From Derrida on down to humble troopers in the trenches of academia, a style that has come to prevail among postmodernists is one of endless complexification and obscurity. The general idea seems to be that the surest way to establish yourself as a profound thinker is to make it very difficult for anybody to understand what your are saying (p. 92).

Many critics are disturbed by the conventional language of post-modern discourse, including Hooks (1995), who asserts that "as a discursive practice it is dominated primarily by the voices of white male intellectuals and/or academic elites who speak to and about one another with coded familiarity" (p. 118).

In addition, the term "post-modern" is represented in various ways in the literature. The phrase is spelled post-Modern when it refers to a historical epoch (Jencks, 1992a). Literary criticism often styles it as postmodern; and, " ...in architecture and as a cultural event it is usually Post-Modern (to indicate a doubly-coded movement)" (Jencks, 1992a, p. 16). Jencks (1995) hyphenates the term to reflect "...that paradoxical dualism, or double coding, which its hybrid name entails: the continuation of Modernism and its transcendence" (p. 30). Toulmin (1985) offers additional insight into the term:

> We must reconcile ourselves to a paradoxical-sounding thought: namely, the thought that *we no longer live in the "modern" world*. The "modern" world is now a thing of the past. Our own natural science today is no longer "modern" science. Instead ... it is rapidly engaged in becoming "post-modern" science: the science of the "postmodern" world, of "postnationalist" politics and "postindustrial" society – the world that has not yet discovered how to define itself in terms of what it *is*, but only in terms of what it has *just-now ceased to be* (p. 254).

Toulmin's logic may explain some of the ambiguity associated with post-modernism because the term specifies a departure point, but leaves the final destination open-ended (Jencks, 1992a).

Post-Modernism is Evolving

Any attempt to define post-modernism is a daunting task for several reasons. First, the post-modern agenda continues to evolve and is ever-changing (Jencks, 1992a). Next, post-modern thought includes contributions from many areas including philosophy, literature, the sciences and the arts (Doll, 1993; Jencks, 1992b); and, perhaps as a result, the word "post-modernism" means different things to different people (Anderson, 1995b). Jencks (1992a) suggests that there are various post-modern movements (e.g., feminism, the green and ecological movement, libertarian theology) which contribute to the overall sense of confusion surrounding post-modernism. Added to these layers of complexity are various *types* of post-modernism: Skeptical post-modernism and affirmative post-modernism (Rosenau, 1995). Skeptical post-modernism is pessimistic, negative and gloomy, suggesting "... that the post-modern age is one of fragmentation, disintegration, malaise, meaninglessness, a vagueness or even absence of moral parameters and societal chaos" (Rosenau, 1995, p. 108). Within our field, Wilson (1997a) has observed that "...postmodern thinking can lead to ... positive or negative outlooks on life" (p. 303). Although affirmative post-modernism tends to agree with the skeptical view of modernity (Rosenau, 1995), it offers "...a more hopeful, optimistic view of the post-modern age" (p. 108). Rosenau (1995) posits that "many affirmatives argue that certain value choices are superior to others, a line of reasoning that would incur the disapproval of the skeptical post-modernists" (p. 109). Further, there are extreme and moderate versions of both types of post-modernism (Rosenau, 1995).

These divergent expositions of post-modernism are a major source of confusion, which complicates any attempts at definition. This paper will consider various explanations of post-modernism and then suggest a new definition that addresses the concerns of critics.

Post-Modernism as a Philosophical Orientation

It is critically important to distinguish between philosophy and theory because post-modernism is often described as a theory (Yeaman, 1996) when it is actually a philosophical orientation (Wilson, 1997a). First, philosophy is interpreted as a composite statement of beliefs and values from which personal purpose and direction are derived (Ely, 1970). Second, philosophy is a foundation for theory (Koetting, 1996; Smith & Ragan, 1999; Snelbecker, 1974). In contrast, a formal theory consists of hypotheses, propositions, and laws (Richey, 1986). Further, a theory is an organized set of related propositions that enable people to explain, predict or control events (Hoover, 1995; Richey, 1986).

Given these definitions, post-modernism is a philosophical orientation because it does not possess any predictive power. Similarly, constructivism, which has many roots in post-modern philosophies (Wilson, Teslow, & Osman-Jouchoux, 1995), is often viewed as an educational philosophy because it does not have the explanatory power of psychological learning theories (Lebow, 1995; Smith & Ragan, 1999).

The Role of Philosophy in Instructional Technology is Ill-Defined

Philosophy is important in our field because it serves as a foundation for theory (Koetting, 1996; Smith & Ragan, 1999; Snelbecker, 1974). For example, Ertmer and Newby (1993) traced the origins of behaviorism, cognitivism and constructivism back to their philosophical foundations in empiricism and rationalism. The roots of any science can be traced back to philosophical origins (Koetting, 1996; Luiz, 1982; Snelbecker, 1974).

In addition, one's theoretical framework is influenced by one's philosophical orientation to the world (Koetting, 1996). For example, behavioral theory is rooted in empiricism, a philosophical view that knowledge is derived from experience (Schunk, 1991). Accordingly, someone who accepts the notion of empiricism may be more inclined to explain learning from a behavioral orientation. While it may seem odd that behaviorism can be discussed alongside post-modernism, the point to be made is that one's philosophical orientation provides insight into one's values, which exert influence over one's perceptions of the relevance of research (Richey, 1998). Philosophical orientation also serve as a screening device that mediates decision-making processes (Luiz, 1982). Recent perspectives on the role of philosophy suggest that applied "fields of study, such as instructional design, do not have educational philosophies; people who study in these fields do" (Smith & Ragan, 1999, p. 14). For these reasons, it becomes increasingly important to explore philosophy because instructional technology is an applied, decision-oriented field (Reigeluth, 1983).

Philosophy is important for other reasons, as well. Philosophical inquiry cultivates the intellectual skills of critical thinking and offers new perspectives on solving problems (Morris, 1999). James D. Finn (1953/1996) believed that our body of systematic theory needed to be constantly expanded by research and *thinking* (emphasis added). Finn believed in vigorously exploring our ideas about instructional technology; in particular, he felt that philosophizing played a critical role in future planning (McBeath, 1972). Ely (1970) felt "...that there should be a philosophy of instructional technology and that it should vary from individual to individual" (p. 81). Still, philosophical inquiry has been relatively absent from the instructional technology literature (Koetting & Januszewski, 1991). In an update to his 1970 article, *Toward a Philosophy of Instructional Technology*, Ely (1999) reminds us that philosophies change in response to social conditions. Ely (1999) suggests that "...if there is any new dimension to the philosophy held by many professionals in the field it is change itself – the readiness to consider, test and adopt new procedures and processes in the goal of obtaining more efficient and effective learning" (Ely, 1999). As with Jim Finn, philosophy plays a critical role in future planning for Ely, as well.

The emergence of post-modernist and constructivist orientations in the field are beginning to spur renewed interest in philosophical inquiry. In 1992, Hylnka, presented a paper titled "Toward a philosophy of educational technology" to the AECT Definitions Committee and concluded that "any philosophy which can help us to illuminate what we do, how we do it, and why we do it, is worth our time and our effort" (Hlynka, 1992, p. 4). Posing questions is the fundamental task of philosophy, which is the basis for research and the foundation upon which our field is built (Koetting, 1996).

Part Two: Toward a Definition of Post-Modernism

Thus far, post-modernism has been defined as a philosophical orientation; however, its relevance to instructional technology requires clarification. In an effort to promote clarity, post-modernism requires further definition, beyond the domain of philosophy. An interdisciplinary review of the literature suggests that post-modernism is approached from multiple perspectives, including a general social condition (Harvey, 1990; Jencks, 1992b; Lyotard, 1979/1984), an intellectual movement (Doll, 1993) and as an historical epoch (Jencks, 1995). Anderson (1995a) believes that "...it's useful to make a distinction between postmodernity and postmodernism – the first being the time (or condition) in which we find ourselves, the second being the various schools and movements it has produced" (pp. 6-7). This perspective offers guidance for constructing a definition of post-modernism. In order to promote clarity, this paper will explore post-modernism as both a general social condition, and as an intellectual movement.

The Post-Modern Condition

As with most post-modern concepts, there are multiple views regarding the condition of postmodernity. Harvey (1990) proposes that postmodernity is a pervasive condition that follows the breakdown of the "Enlightenment project," a great historical era where rational thought and the scientific method replaced superstition and tradition. According to Harvey (1990), "the Enlightenment project ... took it as axiomatic that there was only one possible answer to any question. From this perspective it followed that the world could be controlled and rationally ordered if we could only picture and represent it rightly" (p. 27). Many definitions of the post-modern condition can be linked to the French philosopher, Jean-Francois Lyotard. In 1979 Lyotard authored *The Postmodern Condition: A Report on Knowledge*, upon request by the Council of Universities of the Quebec government. In Lyotard's (1979/1984) report on the state of knowledge in the Western world, he asserted "... that all modern systems of knowledge, including science, had been supported by some 'metanarrative' or 'grand discourse' about the main direction of history" (Anderson, 1995a, p. 4). Anderson's explanation is among the most lucid: "A metanarrative is a *story* of mythic proportions, a story big enough and meaningful enough to pull together philosophy and research and politics and art, relate them to one another, and – above all – give them a unifying sense of direction" (p. 4). Simply put, Lyotard's (1979/1984) definition of postmodernity is "...incredulity toward metanarratives" (p. xxiv). Jencks (1992a) offers another view that contrasts both the negative and positive attributes of the post-modern condition:

> The increase in communication (and the information glut and advertisement), the growth of knowledge (and the consumer society), the rise of leisure (and of Disneyland simulacra), the flowering of Post-Fordism (and the insecurity of workers), the emergence of a new world order (and the *Pax Americana)*, the EC, GATT and global economy (and the Third World debt and IMF riots) – for every positive post-modern trend there is a corresponding negative consequence. (p. 13)

Perhaps unknowingly, Gustafson (1995) provided one of the best descriptions of the post-modern condition, as it relates specifically to the field of IT:

> Rapid changes in world economic conditions are creating enormous pressures on business and industry to become more competitive and help their employees become more productive. Coupled with these pressures are the demands of ever-changing technology and the information explosion. In the past, workers could "train and then apply" what they had learned. Today the question is increasingly, how can employees "learn while applying?" The world is moving so fast that knowledge can become obsolete even before it can be analyzed, developed into training programs, and offered to employees. (p. 24)

For the purpose of defining post-modernism as a general social condition, a synthesis of these various perspectives reveals a set of common themes: globalization, rapid change in the information age and concern for (multicultural) people. Simply put, the post-modern condition refers to the milieu that currently exists in our world, today. Gustafson offers one perspective of the post-modern condition as it relates to instructional technology. Ely's (1999) concept of a "philosophy of change" is; yet, another.

The Post-Modern Intellectual Movement

The section that follows serves to illustrate that the roots of post-modernism can be traced through a variety of disciplines. In order to improve communication in instructional technology and facilitate theory construction, the elusive language of post-modern discourse is conspicuously absent. An abridged version of the post-modern intellectual movement has been constructed in order to identify the sources of post-modern thought. The author respectfully acknowledges that each of the foundations of the post-modern intellectual movement is an area of inquiry unto itself: (1) structuralism, (2) semiotics, (3) poststructuralism, (4) deconstruction, (5) knowledge and power, (6) critical theory, and (7) self-concept.

Structuralism.

Appignanesi and his colleagues (1995) suggest that "postmodern theory is a consequence of this century's obsession with language" (p. 56). Accordingly, post-modernism has its roots in structuralism (Appignanesi et al., 1995), which is "...an intellectual movement most readily associated with the linguist Ferdinand de Saussure and the anthropologist Claude Levi-Strauss" (Bush, 1995, p. 2). Structuralism asserts that the meaning of language (and culture) can be derived from its underlying formal systems (Bush). A central premise of structuralism was the existence of "...a systemic 'center' that organized and sustained an entire structure" (Bush p. 2). Structuralism is concerned with "... underlying rules and conventions that enable language to operate...the social and collective dimension of language [and] the infrastructure of language common to all speakers on an unconscious level" (Appignanesi et al., p. 57). Saussure also proposed that within a language system, the signifier (the word) carried

meaning, and the signified (the concept) was that to which it refers (Appignanesi et al., 1995). Together, a signifier and the signified are a sign and meaning is derived through their relationship, which is socially constructed.

Scheel and Branch (1993) suggest that "...conversation may serve as a basis for designing and implementing culturally pluralistic instruction" (p. 13) because the goals of instruction and the goals of conversation are similar. Both attempt to focus on common topics and create shared meaning, which address some of the concerns of structuralism.

Semiotics.

Semiotics is the science of signs and sign systems and their relationships to language and human behavior (Morris, 1946). Further insight into semiotics is offered by Appignanesi and his colleagues (1995):

> Saussure opened the way to analyzing **culture** itself as a system of signs by proposing that structural linguistics was part of semiology, a general science of signs which studies the various systems of **cultural conventions** which enable human actions to signify meaning and hence **become** signs.

Semiotics is clearly rooted in structuralism, which declares that meaning is founded on a system of shared conventions (or is socially constructed). While the obvious application of semiotics in our field would address message design, a body of literature in the humanities offers unique perspectives on the implications of post-modern thought in instructional technology. In particular, Jay David Bolter (1991) has explored the notion of electronic writing spaces, claiming that the computer is a self-contained system where the entire process of semiosis occurs. Bolter reminds us that in electronic spaces, people learn to read and write differently, interacting with text that is now a texture of signs that include words and graphic elements. Michael Joyce (1995), an acclaimed hypertext novelist, explores technology in relation to new forms of art, instruction, teaching and writing. Joyce addresses the nomadic movement of ideas, enabled through the electronic medium, and he challenges current conceptions of human capabilities. These ideas have implications for the various ways in which meaning can be constructed and/or facilitated through technology and instructional design processes.

Poststructuralism.

Poststructuralism attacks the structuralist notion of a systemic "center" – the underlying rules of a social system – that organizes and sustains language and culture (Bush, 1995). Poststructuralist critics argue that language lacks a central organizing structure, and is inherently unstable and ambiguous (Bush, 1995). Bush (1995) suggests that poststructuralism generally includes three main features: (1) The primacy of theory, (2) the decentering of the subject, and (3) the fundamental importance of the reader. These features are explained in the following paragraphs.

The primacy of theory. Bush (1995) suggests that poststructural criticism is laden with theory, the nature of which challenges and subverts the enduring assumptions and beliefs of western civilization. As a consequence, "...poststructural criticism has been associated with an adversarial stance that often takes on the established institutional and political forces in American society" (Bush, 1995, p. 2).

The decentering of the subject. Contrary to humanistic ideologies, "... the poststructural subject or self is seen to be incoherent, disunified, and in effect 'decentered ...' (Bush, 1995, p. 2). Steiner Kvale (1995) offers further insight:

> The focus on language implies a decentralization of the subject. The self no longer uses language to express itself; rather the language speaks through the person. The individual self becomes a medium for the culture and its language (p. 22).

People are seen as "commentators" who convey "unconscious mainstream ideologies" or as transmitters of "various cultural constructs ... created by the structures of power in a given social environment..." (Bush, 1995, p. 2).

The fundamental importance of the reader. Bush (1995) states that "with the destabilizing or decentering of the author and in more general terms of language as a system, the reader or interpreter has become the focal point of much more poststructural theorizing" (p. 2). Essentially, this tenet posits that readers create their own meanings, regardless of the author's intentions.

Poststructural thinking in instructional technology would encourage an examination of the relationships among the designer/developer (author), the learner (reader) and the use of language in instructional systems. This type of inquiry, like Rowland's (1993) concept of "reflection-in-action," views design as a reflective conversation with the materials of the situation (Schon, as cited in Rowland, 1993). The goal of this type of intelligent activity is not a fixed understanding; but, rather a more integrative awareness of the various ways in which instructional technology can be used to help learners create their own meanings or facilitate meaning that is more closely aligned with the designer/developer's intentions. Discourse analysis is another poststructural technique for revealing systems of thought that "... operate at a linguistic level to produce and regulate knowledge" (De Vaney & Butler, 1996, p. 5). In their examination of early educational technology texts, De Vaney and Butler (1996) employed a rhetorical technique that explored the hierarchy of topics and subject matter as represented in the table of contents and indices. In addition, the authors' intentions were investigated in prefaces and forewards; and, these findings

were then related to discourse-specific systems of thought. The value of this mode of inquiry was an illustration of the systems of thought that have shaped the production of knowledge in our field and the influences that these discourses continue to exert in instructional technology, today.

Deconstruction.

Deconstruction is an offshoot of poststructural theory that was introduced by the philosopher Jacques Derrida. Hlynka and Yeaman (1992) offer a summary of the basic tenets of deconstruction in their ERIC Digest titled *Postmodern Educational Psychology*:

1. Consider concepts, ideas and objects as texts. Textual meanings are open to interpretation.
2. Look for binary oppositions in those texts. Some usual oppositions are good/bad, progress/tradition, science/myth, love/hate, man/woman, and truth/fiction.
3. "Deconstruct" the text by showing how the oppositions are not necessarily true.
4. Identify texts which are absent, groups who are not represented and omissions, which may or may not be deliberate, but are important (pp. 1-2).

One of the assumptions of deconstruction is that virtually any facet of cultural life can be interpreted as a text and subsequently deconstructed (Harvey, 1990). In instructional technology, deconstruction can shed light upon the process of interpretation and lend support to the constructivist notion that learners construct knowledge rather than acquire it. By reducing texts to a play of signs, the goal of deconstruction is to show that perfect signification between a sign and its referent can never exist; thus, an insistence on the endless quality of interpretation (Bolter, 1991).

Knowledge and Power.

The French philosopher, Michel Foucault is the postmodern theorist recognized for addressing the concerns of power and legitimation (Appignanesi et al., 1995). Appignanesi and his colleagues provide a concise summary of Foucault's perspective: "he tackles power from the unusual angle of **knowledge** as systems of thought which become controlling, that is, socially legitimated and institutional" (p. 82). Lyotard (1979/1984) has expressed similar views; he presents knowledge as a commodity, he questions who will have access to it, and, he raises questions about its legitimation.

Knowledge is seen as the most important resource and learning the most important capability for businesses today (Zack, 1999). Knowledge management, which is concerned with "...recognizing, documenting, and distributing explicit and tacit knowledge ..." (Rossett, 1999, p. 64), can be linked to analysis activities in instructional technology. While knowledge management isn't intended to replace training, Rossett (1999) reminds us that we have access to more information than ever before and our challenge as instructional technologists is integrative. Not only should instruction incorporate data from diverse knowledge bases, it should also complement intellectual capital.

Critical Theory.

Critical Theory emerged out of the Frankfurt School, a German philosophical and sociological movement that generally believes that scientific inquiry is riddled with non-theoretical interests because theory development is a product of social processes (Honderich, 1995). Critical theory promotes a radical change in theory and practice, encouraging that every one-sided doctrine should be subjected to criticism. In his book, *Knowledge and Human Interests*, Habermas (1971) advanced the notion of critical theory, which situates knowledge within a philosophical framework based upon three forms of valid inquiry, which produce three forms of valid knowledge (information, interpretations and analyses). Just as post-modernism means different things to different people, alternative definitions of critical theory have emerged in the literature. Anderson (1995a) states that "in literature and the arts, we have critical theorists who insist that when you experience a work of art you don't simply take in the artist's intention, but actively participate in creating whatever meaning or message you find" (p. 9).

In 1983, Koetting (1983) explored the notion of knowledge in instructional technology and developed an epistemological framework for inquiry in our field. Koetting's paper, "Philosophical Foundations of Instructional Technology," (1983) discussed the implications for future research, and, proposed alternative philosophical and theoretical frameworks for inquiry within the field. While an exploration of Koetting's (1983) work is beyond the scope of this paper, the point is that "... the field should embrace a wide variety of research paradigms ..." (Driscoll, 1991, p. 310). Koetting's (1983) paper may be one of the first works to directly relate critical theory to the field of instructional technology (Nichols & Allen-Brown, 1996).

Self concept.

Jacques Lacan, the French psychoanalyst, proclaimed that the unconscious is structured as a language, and that thinking was dependent upon language (Appignanesi et al., 1995). With its roots in psychoanalytic theory, post-modern assumptions about self concept posit that individual identity is "... constructed (and frequently reconstructed) out of many cultural sources" (Anderson, 1995a, p. 10).

The natural connection between self concept and instructional technology would be a refined exploration of learner characteristics. Anderson (1995a) posits that

> ...the postmodern individual is a member of many communities and networks, a participant in many discourses, an audience to messages from everybody and everywhere – messages that present conflicting ideals and norms and images of the world (p. 9).

This notion suggests the importance of considering more variables that could potentially affect learning and instruction. The implication is that knowledge of the "many communities and networks" to which learners belong, may yield strategies for improving the efficacy of instruction.

General Assumptions About Post-Modernism

Post-modernism has been defined as a philosophical orientation, a social condition and as an intellectual movement. In support of the latter definition, the foundations of the intellectual movement were outlined; however, the definition is still incomplete. Doll (1993) cautions that "... it is impossible to give one overarching definition of post-modernism: The movement is too new to define itself and too varied and dichotomous for any one branch to be representative" (p. 5). In response to the question: "What is post-modernism?", Jencks (1995) proclaims that "...its continual growth and movement mean that no definitive answer is possible – at least not until it stops moving" (p. 29).

Given these challenges, I have constructed eight general assumptions about post-modernism from an interdisciplinary review of the literature. The assumptions about post-modernism follow for consideration, discussion, and/or adoption. Clearly, this is not an exhaustive list and many more assumptions about post-modernism are sure to exist. The underlying purpose for constructing these assumptions is to synthesize a large body of information and summarize the post-modern ideology.

Post-Modern Assumptions

1. Pluralism. An essential *goal* of post-modernism is to promote pluralism (Jencks, 1992a). Jencks believes that "...pluralism is the leading 'ism' of post-modernity ... [and it] means the end of a single world view and, by extension, a 'war on totality', a resistance to single explanations, a respect for difference and a celebration of the regional, local and particular" (p. 11). The concept of pluralism is pervasive throughout the post-modern intellectual movement as evidenced by Hlynka and Yeaman's (1992) proclamation that "...if there are multiple ways of knowing then there must be multiple truths" (p. 3).

Pluralism can be seen as an underlying philosophy in instructional technology that allows various perspectives to co-exist. For example, a post-modern worldview would suggest that researchers should not yield to dominant research paradigms. Practitioners would celebrate a type of theoretical pluralism where traditional and non-traditional approaches to learning and instruction could complement each other.

2. Eclecticism. An essential *style* of post-modernism is eclecticism (Jencks, 1992b). According to Jencks (1995), "post-modernism is fundamentally the eclectic mixture of any tradition with that of the immediate past" (p. 27). According to Harvey (1990), "Derrida considers ... collage/montage as the primary form of postmodern discourse [i.e., painting, writing, architecture]" (p. 51) because it produces a signification that is "neither univocal nor stable."

As a style, eclecticism shares the pluralistic philosophy described above; however, in instructional technology it might become manifested as the combination of models to produce viable instruction (Richey, 1995). Instructional technology is an eclectic field, in and of itself, where ideas and resources from other disciplines become integrated into our theoretical and practical bases of knowledge.

3. Knowledge. An essential *tenet* of post-modernism is that people construct knowledge (Wilson et al., 1995). Although the concept that knowledge is constructed rather than acquired is not necessarily a post-modern invention, it clearly positions the post-modern stance on the constructivist side of the fence. As previously discussed, constructivism has many roots in post-modern philosophies (Wilson et al., 1995). While this assumption about knowledge is seemingly innocuous, it is laden with several post-modern issues. From Lyotard (1979/1984), one of the defining characteristics of post-modernism is a disbelief in metanarratives, or established knowledge (a concept that is also linked to pluralism because it rejects single explanations). Lyotard (1979/1984) also promoted the idea that "knowledge is and will be produced in order to be sold, it is and will be consumed in order to be valorized in a new production: in both cases, the goal is exchange" (p. 4). Lyotard's perspective appears visionary in light of contemporary issues surrounding knowledge management. Yeaman (1996) believes that "separating the author from the authority of a text requires acknowledging the political issues of knowledge and power" (p. 276), an idea that is related to post-modern assumptions about truth.

4. Truth. An essential *opinion* of post-modern thinking is that truth is grounded in subjective experience (Wilson et al., 1995). In addressing the question of where truth lies, Hlynka (1996) explains that "traditionally, one assumes that the author of a work is the ultimate authority ... [however] 'truth now lies in the text itself, while the new task becomes one of interpretation" (p. 256). Further, Hlynka illustrates how contemporary literary theory and reader response theory suggest that "...authority lies not only in the author who wrote it, or in the text that says it, but in the reader who reads it" (p. 256). The French sociologist, Jean Baudrillard, advanced the notion of the simulacrum, which occurs when the distinction between representation (e.g., art; signs) and reality breaks down, marking the absence of a basic reality (Appignanesi et al., 1995). Baudrillard's conclusion relates to the notion of truth (albeit an extreme form of postmodernism); and, his ideas remain an important part of the movement's intellectual history. A more common opinion is offered by the philosopher, Richard Rorty (as cited in Anderson, 1995a), who posits that "truth is made rather than found (p. 8);" a view that interprets reality as being socially constructed.

As with the assumption about knowledge, these ideas about the nature of truth are reminiscent of constructivist ideas in instructional technology. In particular, meaning is understood to be rooted in experience, which supports the argument for situating learning activities in authentic environments (Duffy & Jonassen, 1992). In this regard, authority or truth would reside not only in the learning environment and materials, but also with the learner.

5. Language. An essential *theme* of postmodern thought is that language is deeply involved in the social construction of reality (Anderson, 1995a). From a poststructuralist perspective, Weedon (as cited in Anderson & Damarin, 1996) suggests that "language enables people to think, speak and give meaning to the world around them" (p. 270). Further clarification about language is offered by Anderson and Damarin (1996) who state that "how people write, talk, and otherwise communicate about what they know, do, and believe reflects the ways they are shaped by particular discourse communities" (p. 270). An underlying, poststructural issue associated with the role of language is that meaning is indeterminate because language is inherently unstable and ambiguous (Bush, 1995).

Scheel and Branch (1993) have reviewed the benefits of focusing on common topics and creating shared meaning through dialogue. Another concept of learning is based upon hermeneutic principles that views learning as a process of interpretation (Jonassen et al., 1997). While the instructional designer can use language that increases the probability of "correct" interpretation, Jonassen and his colleagues (1997) also explain how hermeneutics can be used in instructional design to assist with personal interpretation. Although seemingly simplistic, discussion questions at the beginning of a lesson can be used purposefully to stimulate the development of subjective meaning (Jonassen et al., 1997).

6. Communication. An essential *issue* in post-modernism is communication (Harvey, 1990). Transmission models of communication typically include a sender who encodes a message, the message, a channel; and, a receiver who decodes information (Shannon & Weaver, 1949). Additional components of the model usually include noise and feedback. Communication is a foundational issue in post-modernism because each component (and every element) in the communications process is scrutinized. Post-modern assumptions, as presented here, posit that authority lies not only in the sender and the message, but also in the receiver. They also address post-modern questions of knowledge, power and legitimation as they relate to the information source and the message. Finally, with respect to noise and feedback, the post-modern concerns about communication are also entwined with post-modern sciences of complexity, described below.

7. Complexity. Jencks (1992a) describes a post-modern science as shifting "... from fairly inanimate matter (planets and physical objects) to living systems (social groups as well as individuals) (p. 15)." As an example, Jencks (1992a) points to a view of nature as a self-organizing system. From this perspective, systems are interpreted as dynamic, living entities which consist of non-linear processes and a high degree of feedback, which characterize all life (Jencks, 1992a). An applied example of this concept could be Artificial Intelligence, complex computer systems that are designed to adapt to environmental stimuli. Chaos methodology is another application that "... shifts emphasis from relationships of cause and effect to more interactive, multivariant approaches that stress the importance of defining patterns, form, self-organization, and adaptive qualities of complex processes" (Krippner & Winkler, 1995, p. 166).

A post-modern interpretation of chaos theory would jettison the notion of deterministic predictability and posit that chaos is inherent in all systems; thus, explaining the irregular behavior of nonlinear dynamic systems. The implications of this orientation would be an examination of the myriad variables that interact to produce learning and "developing metacognitive awareness in learners as a way of helping them deal with a complex and ill-structured world" (Jonassen et al., 1997, p. 32). There may also be implications for understanding the role of human emotion as a strategy for managing chaos in learning, as well (Jonassen et al., 1997).

8. Self. Post-modernism interprets an individual as a pluralistic person with a disappearing self. Anderson (1995b) states that "the postmodern person is a *multi-community* person, and his or her life as a social being is based on adjusting to shifting contexts and being true to divergent – and occasionally conflicting – commitments" (p. 128). Further, Anderson (1995b) posits that "individuals negotiate (and renegotiate) personal identity, struggling to make internal peace among the multiple components of their selves and the claims of the different communities to which they are connected" (p. 128). Gergen, (1995) a leading exponent of post-modern psychology, challenges traditional assumptions about human development as "...a single, basic self to which we can be true" (p. 137) in favor of the idea that people carry the potential for many selves which can be realized in various social settings (Anderson, 1995b).

These ideas are opposed to beliefs about the importance of establishing a strong, integrated sense of personal identity, which paints a one-dimensional picture of the learner. While there may be central tendencies related to the concept of self, post-modernists would argue that we have paid to much attention to them: and have ignored the complexity of human existence (Gergen, 1995). In our field, the concept of self reminds us that instructional design needs to address more than practical issues and provide for the human spirit (Keller, 1979)

Part Three: Potential Contributions of Post-Modern Concepts in Instructional Technology

The eight general assumptions just reviewed demonstrate the depth and range of post-modern thought. Together, they represent a body of ideas that could define a post-modern philosophical orientation, however, these assumptions are still difficult to relate to the field of instructional technology. Accordingly, the following section will summarize several core concepts about post-modernism, from which potential contributions to the field of instructional technology can be discussed. The core concepts that define a post-modern philosophy of instructional technology include:

1. The philosophical "core" of post-modern instructional technology is a belief in pluralism, which can be described as respect for difference and a resistance to single explanations.
2. Knowledge, truth and reality are constructed by people and groups of people.
3. Criticism is an appropriate method for inquiry in instructional technology.
4. Systems are interpreted as highly complex entities with adaptive qualities.

The philosophical "core" of post-modern instructional technology is a belief in pluralism, which can be described as respect for difference and a resistance to single explanations. As a defining characteristic of post-modernism, pluralism is a concept that has pervasive and far-reaching impact in instructional technology. At the surface, pluralism means that multiple perspectives may be valid and that there is no single best way to develop instruction (Davies, 1981/1991; Hlynka & Yeaman, 1992). Similarly, pluralism in our field would posit that there is no single best model or theory of learning. From an applied perspective, pluralism could be seen as an eclectic approach where multiple views of content, strategies and perspectives are offered (Wilson et al., 1995); however, this is still a surface view of the concept.

Beneath the surface; however, the concept of pluralism runs deeper. The issues of integration that affect the field (Seels, 1995) could be guided by post-modern philosophy, particularly with respect to "the integration of knowledge from the arts with knowledge from the sciences in an age of technology" (p. 252). Post-modernism accepts the idea that art, craft and science could co-exist in instructional technology. While diverse views of the art, craft and science debate continue to emerge in the literature (see Clark & Estes, 1998; Braden, 1996; Merrill, Drake, Lacy, Pratt, & ID2 Research Group, 1996; Davies, 1981/1991), post-modernism celebrates these multiple perspectives.

The implications of pluralism in relation to research and the needs of practitioners are also far-reaching. For example, the notion of the learner as a pluralistic person, situated in contexts that are continuously shifting, suggests the need to consider a multiplicity of variables related to learner characteristics and ecological systems (see Bronfenbrenner, 1979; 1988), all of which influence learning and instruction. Another example concerns alternative research methods that are emerging in the literature including multiple interpretations of data and self-reflexive technique, the recognition of one's own values in the research process (Anderson & Damarin, 1996). These examples provide a framework for conceptualizing the implications of pluralism in instructional technology. The fundamental concept of pluralism is that multiple perspectives are valid, an ideology that can be applied to various facets of the theory and practice of instructional technology.

Knowledge, truth and reality are constructed by people and groups of people. *As a foundation for constructivism (Wilson et al., 1995), post-modern philosophies of knowledge, truth and reality are exerting great influence on the field. Post-modernists believe that knowledge is something that is created rather than found, which is mirrored in constructivist ideas about cognition (i.e., people create meaning through experience as opposed to*

acquiring it). The concepts of subjective truth and socially constructed reality are also beliefs that constructivism and post-modernism share. Together, the concepts of knowledge, truth and reality have helped to mold and shape the emerging theory base for constructivism, including agenda-building around specific issues such as situated and collaborative learning

The philosophical view that reality is socially constructed can provide a framework for addressing issues surrounding cultural diversity. For example, Scheel and Branch (1993) have offered strategies for designing culturally pluralistic instruction based upon the premise that one's cultural background will influence interactions between the learner, content, teacher, media and context. Recognizing that learners are culturally inscribed and relational to the societal context, they believe that language and conversation can be used strategically to promote cultural pluralism and increase the potential for learner achievement. These ideas can be directly linked to diverse theories of language that provide a foundation for the post-modern intellectual movement discussed earlier.

Criticism is an appropriate method for inquiry in instructional technology. Scientific and critical perspectives can be complementary in the field of instructional technology (Wilson, 1997b). For example, a scientific approach in our field would pose research questions that require predictions and hypotheses while a critical perspective is more like literary or film criticism, exploring various layers of meaning. These approaches can be integrated and work together because,

> Science and technology, if not checked, would tend to see things in terms of their instrumental value, in terms of their scientific classifications. Criticism, most skillfully practiced by the postmodern theorists, brings balance to the picture by closely examining the details. Technology alone tends to be problem-driven and goal-based. Most attention goes to whether objectives are achieved. Criticism looks beyond the objectives to examine the unintended side effects, the secondary meanings, the shades of gray (Wilson, 1997b, p. 25).

While criticism should not become an exclusive method of inquiry, its value in instructional technology is still misunderstood. The rationale for criticism is summarized by Belland and his colleagues (1991): "as a field which draws knowledge and practice from a wide range of arts and sciences, educational technology should be able to use a variety of ways of investigating and knowing in order to guide inquiry and practice" (p. 151).

Systems are interpreted as highly complex entities with adaptive qualities. While the humanities provide a major source of post-modern thought (Hlynka & Yeaman, 1992), post-modern science interprets systems as highly complex entities with adaptive qualities (Jencks, 1992a). Although the growing base of literature that addresses post-modern instructional technology has not yet explicated the implications of post-modern science, the concept of highly complex systems has received some attention in the field (see You, 1993). As learning and education become increasingly more complex in our knowledge-based society (Trilling & Hood, 1999) the concept of complex systems could offer a philosophical perspective to guide future inquiry. For example, the post-modern concept of complexity could offer insight into research on flexible learning systems that keep pace with rapid changes in organizational structures, processes and information technology (a by-product of the post-modern condition discussed earlier). Accordingly, a post-modern philosophical orientation might support the need for contextual analysis which broadens the number of variables that designers consider during the design of instructional systems (Tessmer & Richey, 1997).

Conclusion

This paper has attempted to illustrate the relevance of post-modernism in the field of Instructional Technology. In pursuit of this goal, post-modernism was defined as a philosophy, social condition and an intellectual movement. As a philosophical orientation, post-modernism values multiple perspectives and the contextual construction of meaning (Wilson, 1997a). The post-modern condition describes a rich and diverse milieu that is influenced by globalization, rapid change in the information age and multiculturalism. As an intellectual movement, post-modernism is deeply rooted in theories of language and various disciplines including the arts, sciences and humanities. As an eclectic field, instructional technology integrates ideas from a variety of disciplines, which may help to explain the emergence of post-modern thought within the discipline. Seels (1989) describes the field as the confluence of three disciplines, including media in education, psychology of instruction and systematic approaches to education. Richey (1986) has outlined four theoretical foundations of the field: communications theory, general systems theory, learning theory and instructional/curriculum theory. Given these broad perspectives on the origins of instructional technology, the roots of post-modernism (e.g., semiotics, psychology, theories of language) can be linked to our history and should not be ignored.

The voices of our founders and the early discourses of the field have established a valuable role for philosophical inquiry in instructional technology; however, the path was never very clear. And, with post-modernism, there are multiple paths that diffuse meaning. Based upon an interdisciplinary review of the literature,

this paper has explored the sources of confusion surrounding post-modernism. Next, three definitions of post-modernism were proposed (i.e., a philosophy, a social condition and an intellectual movement). Then, the potential contributions for the field were discussed, all in order to promote communication within the field and facilitate an agenda-building process around post-modern issues.

Post-modernism holds promise for guiding research and development in instructional technology. The diversity of theories and concepts in our field, many of which have been borrowed from other disciplines, are often broadly organized around three distinct areas of inquiry such as behaviorism, cognitivism and constructivism (Ertmer & Newby, 1993). Accordingly, the theoretical perspectives in our field do not always enrich each other because research is often aligned with a particular orientation. While there is recognition that no single theoretical perspective can completely explain learning (Snelbecker, 1989; Smith & Ragan, 1993), the potential relationships between differing views could lead to stronger theories, a promise that could be realized through an affirmative orientation to post-modernism.

Finn (1962/1996) believed that technology was "... a way of thinking about certain classes of problems and their solutions" (p. 48). Post-modernism offers a way to think about thinking. It may not be everyone's "cup of tea," but our field can be enriched by exploring alternative views. At the very least, post-modernism challenges us to understand our own beliefs and recognize how our values are represented in everything that we do.

Biography

David L. Solomon is completing his dissertation in the Instructional Technology program at Wayne State University. In addition to teaching college students at the secondary and post-secondary level, he has more than 13 years experience designing, developing and implementing instruction and performance improvement solutions for multinational and privately held businesses (he can be reached at writechange@wwnet.net).

References

Anderson, J. H., & Damarin, S. K. (1996). Poststructural feminism and research in educational communications and technology. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 269-275). New York: Simon & Schuster Macmillan.

Anderson, W. T. (1995a). Introduction: What's going on here? In W. T. Anderson (Ed.), *The truth about the truth: De-confusing and re-constructing the postmodern world*. New York: G.P. Putnam's Sons.

Anderson, W. T. (Ed.). (1995b). *The truth about the truth: De-confusing and re-constructing the postmodern world*. New York: G.P. Putnam's Sons.

Appignanesi, R., Garratt, C., Sardar, Z., & Curry, P. (1995). *Introducing Postmodernism*. New York: Totem Books.

Belland, J. C., Duncan, J. K., & Deckman, M. (1991). Criticism as methodology for research in educational technology. In D. Hlynka & J. C. Belland (Eds.), *Paradigms regained: The uses of illuminative, semiotic and post-modern criticism as modes of inquiry in educational technology* (pp. 151-164). Englewood Cliffs, NJ: Educational Technology Publications, Inc.

Bolter, J. D. (1991). *Writing space: The computer, hypertext, and the history of writing*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Braden, R. A. (1996). The case for linear instructional design and development: A commentary on models, challenges, and myths. *Educational Technology, 36*(2), 5-23.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, Mass.: Harvard University Press.

Bronfenbrenner, U. (1988). Interacting systems in human development. Research paradigms: Present and future. In N. Bolger, A. Caspi, G. Downey, & M. Moorehouse (Eds.), *Persons in context: Developmental processes* (pp. 25-49). Cambridge; New York: Cambridge University Press.

Bush, H. K. (1995). *Poststructuralism as theory and practice in the english classroom* (ERIC Digest EDO-CS-95-07). Washington, DC: Office of Educational Research and Improvement (ERIC Document Reproduction Service No. ED 387 794).

Clark, R. E., & Estes, F. (1998b). Technology or craft: What are we doing? *Educational Technology, 38*(5), 5-11.

Davies, I. K. (1981/1991). Instructional development as an art: One of the three faces of ID. In D. Hlynka & J. C. Belland (Eds.), *Paradigms regained: The uses of illuminative, semiotic and post-modern criticism as modes*

of inquiry in educational technology . Englewood Cliffs, NJ: Educational Technology Publications, Inc. (Reprinted from *Performance and Instruction*, July 1981).

De Vaney, A., & Butler, R. P. (1996). Voices of the founders: Early discourses in educational technology. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 3-45). New York: Simon & Schuster Macmillan.

Doll, W. E. (1993). *A post-modern perspective on curriculum*. New York: Teachers College Press.

Driscoll, M. P. (1991). Paradigms for research in instructional systems. In G. J. Anglin (Ed.), *Instructional technology: Past, present, and future* (pp. 310-317). Englewood, CO: Libraries Unlimited, Inc.

Duffy, T. M., & Jonassen, D. H. (Eds.). (1992). *Constructivism and the technology of instruction: A conversation*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Ely, D. P. (1970). Toward a philosophy of instructional technology. *British Journal of Educational Technology, 1*, 81-94.

Ely, D. P. (1999). Toward a philosophy of instructional technology: thirty years on. *British Journal of Educational Technology, 30*(4), 305-10.

Ertmer, P. A., & Newby, T. J. (1993). Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance Improvement Quarterly, 6*(4), 50-72.

Finn, J. D. (1953/1996). Professionalizing the audio-visual field. In D. P. Ely & T. Plomp (Eds.), *Classic writings on instructional technology* (pp. 231-241). Englewood, Colorado: Libraries Unlimited, Inc. (Reprinted from *Audio-visual communications review* 1(1):6-18 with permission of Association for Educational Communications and Technology).

Finn, J. D. (1962/1996). A walk on the altered side. In D. P. Ely & T. Plomp (Eds.), *Classic writings on instructional technology* (pp. 47-55). Englewood, Colorado: Libraries Unlimited, Inc. (Reprinted with permission from *Phi delta kappan* 44(1):29-34).

Gergen, K. (1995). The healthy, happy human being wears many masks. In W. T. Anderson (Ed.), *The truth about the truth: De-confusing and re-constructing the postmodern world*. New York: G.P. Putnam's Sons.

Gustafson, K. L. (1995). Instructional design fundamentals: Clouds on the horizon. In B. B. Seels (Ed.), *Instructional design fundamentals: A reconsideration*. Englewood Cliffs, NJ: Educational Technology Publications, Inc.

Gustafson, K. L., & Tillman, M. H. (1991). Introduction. In L. J. Briggs, K. L. Gustafson, & M. H. Tillman (Eds.), *Instructional design*. Englewood Cliffs, NJ: Educational Technology.

Habermas, J. (1971). *Knowledge and human interests*. London: Heinemann.

Harvey, D. (1990). *The condition of postmodernity: An enquiry into the origins of cultural change*. Malden, Massachusetts: Blackwell Publishers, Inc.

Hlynka, D. (1992). *Towards a philosophy of educational technology* (Draft notes on philosophy presented to the AECT Definitions Committee). Winnipeg, Canada: University of Manitoba.

Hlynka, D. (1996). Postmodernism. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 253-265). New York: Simon & Schuster Macmillan.

Hlynka, D., & Yeaman, A. R. J. (1992). *Postmodern educational technology* (ERIC Digest EDO-IR-92-5). Washington, DC: Office of Educational Research and Improvement (ERIC Document Reproduction Service No. ED 348 042).

Honderich, T. (Ed.). (1995). *The Oxford companion to philosophy*. New York: Oxford University Press.

Hooks, B. (1995). Postmodern blackness. In W. T. Anderson (Ed.), *The truth about the truth: De-confusing and re-constructing the postmodern world*. New York: G.P. Putnam's Sons.

Hoover, K. R. (1995). *The elements of social scientific thinking*. (6th ed.). New York: St. Martin's Press.

Jencks, C. (1992a). The post-modern agenda. In C. Jencks (Ed.), *The post-modern reader*. New York: St. Martin's Press.

Jencks, C. (1992b). Preface: Post-modernism -- the third force. In C. Jencks (Ed.), *The post-modern reader*. New York: St. Martin's Press.

Jencks, C. (1995). What is post-modernism? In W. T. Anderson (Ed.), *The truth about the truth: De-confusing and re-constructing the postmodern world*. New York: G.P. Putnam's Sons.

Jonassen, D. H. (Ed.). (1996). *Handbook of research for educational communications and technology*. New York: Simon & Schuster Macmillan.

Jonassen, D. H., Hennon, R. J., Ondrusek, A., Samouilova, M., Spaulding, K. L., Yueh, H.-P., Li, T., Nouri, V., DiRocco, M., & Birdwell, D. (1997). Certainty, determinism, and predictability in theories of instructional design: Lessons from science. *Educational Technology, 37*(1), 27-34.

Joyce, M. (1995). *Of two minds: Hypertext pedagogy and poetics*. Ann Arbor, MI: University of Michigan Press.

Keller, J. M. (1979). Motivation and instructional design: A theoretical perspective. *Journal of Instructional Development, 2*(4), 26-34.

Koetting, J. R. (1983). *Philosophical foundations of instructional technology*. Paper presented at the annual meeting of the Association for Educational Communications and Technology, New Orleans, LA.

Koetting, J. R. (1996). Philosophy, research, and education. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 1137-1147). New York: Simon & Schuster Macmillan.

Koetting, J. R., & Januszewski, A. (1991). *Theory building and educational technology: Foundations for reconceptualization (Report No. IR-015 158)*. Paper presented at the 1991 Annual National Convention of the Association for Educational Communications and Technology (AECT).

Krippner, S., & Winkler, M. (1995). Studying consciousness in the postmodern age. In W. T. Anderson (Ed.), *The truth about the truth: De-confusing and re-constructing the postmodern world*. New York: G.P. Putnam's Sons.

Kvale, S. (1995). Themes of postmodernity. In W. T. Anderson (Ed.), *The truth about the truth: De-confusing and re-constructing the postmodern world*. New York: G.P. Putnam's Sons.

Lebow, D. (1995). Constructivist values for instructional design: Five principles toward a new mindset. In B. B. Seels (Ed.), *Instructional design fundamentals: A reconsideration* . Englewood Cliffs, NJ: Educational Technology Publications, Inc.

Luiz, T. (1982). *A comparative study of humanism and pragmatism as they relate to decision making in instructional development processes*. Unpublished Doctoral Dissertation, Michigan State University, East Lansing.

Lyotard, J.-F. (1979/1984). *The postmodern condition: A report on knowledge*. Minneapolis: University of Minnesota Press. (Originally published in France as *La condition postmoderne: rapport sur le savoir*, copyright © 1979 by Les Editions de Minuit).

McBeath, R. J. (Ed.). (1972). *Extending education through technology: Selected writings by James D. Finn on instructional technology*. Washington, DC: Association for Educational Communications and Technology.

Merrill, M. D., Drake, L., Lacy, M. J., Pratt, J., & the ID_2 Research Group (1996). Reclaiming instructional design. *Educational Technology, 36*(5), 5-7.

Morris, C. W. (1946). *Signs, language and behavior*. Englewood Cliffs, NJ: Prentice Hall.

Morris, T. (1999). *Philosophy for dummies*. Foster City, CA: IDG Books Worldwide, Inc.

Nichols, R. G., & Allen-Brown, V. (1996). Critical theory and educational technology. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 226-252). New York: Simon & Schuster Macmillan.

Reigeluth, C. M. (Ed.). (1983). *Instructional design theories and models: An overview of their current status*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Richey, R. C. (1986). *The theoretical and conceptual bases of instructional design*. New York: Nichols Publishing Co.

Richey, R. C. (1995). Instructional design theory and a changing field. In B. B. Seels (Ed.), *Instructional design fundamentals: A reconsideration*. Englewood Cliffs, NJ: Educational Technology Publications, Inc.

Richey, R. C. (1997). Agenda-building and its implications for theory construction in instructional technology. *Educational Technology, 37*(1), 5-11.

Richey, R. C. (1998). The pursuit of useable knowledge in instructional technology. *Educational Technology Research and Development, 46*(4), 7-22.

Rosenau, P. M. (1995). Affirmatives and skeptics. In W. T. Anderson (Ed.), *The truth about the truth: De-confusing and re-constructing the postmodern world* . New York: G.P. Putnam's Sons.

Rossett, A. (1999). Knowledge management meets analysis. *Training & Development, 53*(5), 63-68.

Rowland, G. (1993). Designing and instructional design. *Educational Technology Research and Development, 41*(1), 79-91.

Saettler, P. (1990). *The evolution of American educational technology*. Englewood, Colorado: Libraries Unlimited, Inc.

Scheel, N. P., & Branch, R. C. (1993). The role of conversation and culture in the systematic design of instruction. *Educational Technology, 33*(8), 7-18.

Schunk, D. H. (1991). *Learning theories: An educational perspective*. New York: Macmillan.

Seels, B. (1989). The instructional design movement in educational technology. *Educational Technology, 29*(5), 11-15.

Seels, B. (1995). Instructional design fundamentals: Issues of integration. In B. B. Seels (Ed.), *Instructional design fundamentals: A reconsideration* (pp. 247-253). Englewood Cliffs, NJ: Educational Technology Publications, Inc.

Seels, B. B., & Richey, R. C. (1994). *Instructional technology: The definition and domains of the field*. Washington, DC: Association for Educational Communications and Technology.

Shannon, C., & Weaver, W. (1949). *The mathematical theory of communication*. Urbana, IL: University of Illinois Press.

Smith, P. L., & Ragan, T. J. (1993). *Instructional Design*. New York: Macmillan Publishing Company.

Smith, P. L., & Ragan, T. J. (1999). *Instructional design*. (2nd ed.). Upper Saddle River, NJ: Prentice-Hall, Inc.

Snelbecker, G. E. (1974). *Learning theory, instructional theory and psychoeducational design*. New York: McGraw.

Snelbecker, G. E. (1989). Contrasting and complementary approaches to instructional design. In C. M. Reigeluth (Ed.), *Instructional theories in action* (pp. 321-337). Hillsdale, NJ: Lawrence Erlbaum Associates.

Tessmer, M., & Richey, R. C. (1997). The role of context in learning and instructional design. *Educational Technology Research and Development, 45*(2), 85-115.

Toulmin, S. (1985). *The return to cosmology: Postmodern science and the theology of nature*. Berkeley: University of California Press.

Trilling, B., & Hood, P. (1999). Learning, technology, and education reform in the knowledge age or "we're wired, webbed, and windowed, now what?" *Educational Technology, 39*(3), 5-18.

Wilson, B., Teslow, J., & Osman-Jouchoux, R. (1995). The impact of constructivism (and postmodernism) on ID fundamentals. In B. B. Seels (Ed.), *Instructional design fundamentals: A reconsideration*. Englewood Cliffs, NJ: Educational Technology Publications, Inc.

Wilson, B. G. (1997a). The postmodern paradigm. In C. R. Dills & A. J. Romiszowski (Eds.), *Instructional Development Paradigms*. Englewood Cliffs, NJ: Educational Technology Publications, Inc.

Wilson, B. G. (1997b). Thoughts on theory in educational technology. *Educational Technology, 37*(1), 22-27.

Yeaman, A. R. J. (1996). Postmodern and poststructural theory: Version 1.0. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 275-292). New York: Simon & Schuster Macmillan.

You, Y. (1993). What can we learn from chaos theory? An alternative approach to instructional systems design. *Educational Technology Research and Development, 41*(3), 17-32.

Zack, M. H. (1999). Developing a knowledge strategy. *California Management Review, 41*(3), 125-145.